

CLAIMS

1. A permanent magnet molding apparatus which is characterized by comprising:

a transferable metal die unit including:

a die having a cavity of a desired cross-sectional shape in which magnet molding material powder is filled, the cavity extending in groovelike form in a specific direction on a surface of the die;
a lid member placed against a facing surface of said die as if covering said cavity; and
a pair of punches having the same cross-sectional shape as said cavity, said punches being positioned to fit in said cavity such that said punches close said cavity at both ends thereof, and said punches being made slidable in directions in which said punches go into contact with and become separated from the magnet molding material powder;

pressurizing means for holding the metal die unit which has been transferred with said magnet molding material powder filled in said cavity and for pressurizing said magnet molding material powder by driving said two punches such that said two punches slide in their approaching directions; and

magnetic field generating means for magnetizing the

magnet molding material powder pressurized in said cavity while applying a magnetic field thereto in a direction perpendicular to a direction of pressurization.

2. The permanent magnet molding apparatus as recited in claim 1, said permanent magnet molding apparatus being characterized in that said magnetic field generating means includes a pair of yokes located on an upper surface of the lid member and on a bottom surface of the die of said metal die unit and a coil wound around at least one of said yokes, wherein said yokes are movable in directions along said facing surface of the lid member and the die of said metal die unit.

3. The permanent magnet molding apparatus as recited in claim 2, said permanent magnet molding apparatus being characterized in that said pair of yokes are attracted by each other and sandwich said lid member and said die to press against said facing surface when said coil is actuated.

4. The permanent magnet molding apparatus as recited in claim 1, said permanent magnet molding apparatus being characterized in that said metal die unit has a gap of 0.01 to 0.1 mm in part of said facing surface.

5. The permanent magnet molding apparatus as recited in claim 1, said permanent magnet molding apparatus being characterized in that said metal die unit has a base frame on which said die is located and said pair of punches has pushing parts at one end which are pressed by said pressurizing means and caused to slide on said base frame while being guided along the extending direction of said cavity.

6. The permanent magnet molding apparatus as recited in claim 5, said permanent magnet molding apparatus being characterized in that said pressurizing means is a pair of cylinders situated along the extending direction of said cavity, wherein pistons of said cylinders extend face to face with end surfaces of the pushing parts of said punches to push said pushing parts, causing said punches to slide in their mutually approaching directions.

7. The permanent magnet molding apparatus as recited in claim 5, said permanent magnet molding apparatus being characterized by further comprising a grasping member which engages with said base frame, wherein said grasping member fits slidably in the extending direction of said cavity and said lid member is forced against said die and held in

position via a locking mechanism between said base frame and said grasping member.

8. The permanent magnet molding apparatus as recited in claim 7, said permanent magnet molding apparatus being characterized in that said grasping member is divided into two portions in its sliding direction.

9. The permanent magnet molding apparatus as recited in claim 1, said permanent magnet molding apparatus being characterized in that said metal die unit has a base frame on which said die is located and said pair of punches has pushing parts at one end which are pushed by said pressurizing means and caused to slide on said base frame while being guided along the extending direction of said cavity, said pushing parts having rotatably mounted rollers.

10. The permanent magnet molding apparatus as recited in claim 9, said permanent magnet molding apparatus being characterized in that said pressurizing means has first guiding surfaces for guiding said rollers and second guiding surfaces formed immediately adjacent to the respective first guiding surfaces, wherein the distance between said second guiding surfaces is smaller than the

distance between said first guiding surfaces and said second guiding surfaces press against said rollers, causing said punches to slide in their mutually approaching directions.

11. The permanent magnet molding apparatus as recited in claim 9, said permanent magnet molding apparatus being characterized by further comprising a grasping member which engages with said base frame, wherein said grasping member fits slidably in the extending direction of said cavity and said lid member is forced against said die and held in position via a locking mechanism between said base frame and said grasping member.

12. The permanent magnet molding apparatus as recited in claim 11, said permanent magnet molding apparatus being characterized in that said grasping member is divided into two portions in its sliding direction.